

# Postgraduate Certificate

## Robotics in Industrial Process Automation





## Postgraduate Certificate Robotics in Industrial Process Automation

- » Modality: online
- » Duration: 6 weeks
- » Certificate: TECH Technological University
- » Dedication: 16h/week
- » Schedule: at your own pace
- » Exams: online

Website: [www.techtitute.com/us/engineering/postgraduate-certificate/robotics-industrial-process-automation](http://www.techtitute.com/us/engineering/postgraduate-certificate/robotics-industrial-process-automation)

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# 01

# Introduction

Robotics and Machine Vision have found in the Industry an important niche to grow, since it is a sector where the cost of processing and the unit quality of each unit produced are variables that can mean large variations in the overall profitability of the facility.

This program offers the engineering professionals an advanced certificate that will allow them to delve into the techniques and steps necessary to design and implement a complete automated solution. A 100% online program by a team of teachers specialized in the area of Robotics, which will allow you to progress in one of the current fields on the rise.





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*A Postgraduate Certificate with multimedia content that can be accessed 24 hours a day from any device with internet connection”*

New technologies have advanced exponentially in recent years causing sectors such as industry to grow enormously thanks, among other factors, to improvements in the automation of robotics. This progress has led to the creation of jobs in the field of engineering. With a positive projection the engineer faces the future in this field.

This Postgraduate Certificate will allow students to acquire in-depth knowledge in the three fundamental points of Industrial Process Automation: electrical design, automation design and programming/configuration of equipment. Thus, throughout the six weeks of this program, the engineering professionals will have access to a theoretical-practical approach that will allow them to master the calculations, considerations and equipment necessary for the construction of an electrical panel, communication networks, architectures and the most modern solutions in industrial applications or industrial instrumentation.

An advanced program that will allow the students the exhaustive analysis of the programming of equipment beyond the Programmable Logic Control (PLC), with special emphasis on robots, vision equipment and drives and web interfaces. All this with a syllabus made up of multimedia material that can be accessed from the first day with an electronic device with internet connection.

An excellent opportunity for the engineering professionals who wishes to progress in their career with a flexible program that allows them to combine his work responsibilities with a quality program. A 100% online program imparted by a team of teachers specialized in the area of Robotics, which will allow you to progress in one of the current sectors on the rise.

This **Postgraduate Certificate in Robotics in Industrial Process Automation** contains the most complete and up-to-date program on the market. The most important features include:

- ◆ Development of case studies presented by experts in robotic engineering
- ◆ The graphic, schematic, and practical contents with which they are created, provide scientific and practical information on the disciplines that are essential for professional practice
- ◆ Practical exercises where self-assessment can be used to improve learning
- ◆ Its special emphasis on innovative methodologies
- ◆ Theoretical lessons, questions to the expert, debate forums on controversial topics, and individual reflection assignments
- ◆ Content that is accessible from any fixed or portable electronic device with an Internet connection



*Access a university program that will keep you up-to-date with current machine safety standards"*

“

*An online education where you will be able to perform automation and plant simulation. Click and enroll”*

The program's teaching staff includes professionals from the sector who contribute their work experience to this educational program, as well as renowned specialists from leading societies and prestigious universities.

Its multimedia content, developed with the latest educational technology, will provide the professional with situated and contextual learning, i.e., a simulated environment that will provide an immersive education programmed to learn in real situations.

The design of this program focuses on Problem-Based Learning, by means of which the professionals must try to solve the different professional practice situations that are presented throughout the program. For this purpose, the student will be assisted by an innovative interactive video system created by renowned experts.

*Master the industrial robotics of electrical actuation thanks to this Postgraduate Certificate.*

*Would you like to master the Programming and Configuration of Equipment in Industrial Plants? Enroll now.*



# 02

# Objectives

The main goal of this Postgraduate Certificate is to enable the IT professionals to achieve their career progression thanks to a program in which they will delve into the automation of industrial processes. A knowledge that will enable you to propose new ways of organizing operations using state machines, implement control paradigms in real applications and lay the foundations for the design of facilities for Industry 4.0. The Relearning system, used by TECH in all of its programs, will facilitate learning and, therefore, the progress of the students.





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*A 100% online program that will help you to apply clean and efficient programming techniques in PLCs"*



## General Objectives

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- ◆ Develop the theoretical and practical foundations necessary to carry out a robot design and modeling project
- ◆ Provide the graduates with an exhaustive knowledge of the automation of industrial processes that will allow them to develop their own strategies
- ◆ Acquire the professional skills of an expert in automatic control systems in Robotics



*Enroll in a Postgraduate Certificate that will allow you to deepen in the programming of vision systems”*





## Specific Objectives

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- ◆ Analyze the use, applications and limitations of industrial communication networks
- ◆ Establish machine safety standards for correct design
- ◆ Develop clean and efficient programming techniques in PLCs
- ◆ Propose new ways of organizing operations using state machines
- ◆ Demonstrate the implementation of control paradigms in real PLC applications
- ◆ Fundamentalize the design of pneumatic and hydraulic installations in automation
- ◆ Identify the main sensors and actuators in robotics and automation



03

# Course Management

TECH offers in all its programs a quality education at the academic forefront. This is possible thanks to the rigorous selection of the entire teaching team that teaches its programs. In this Postgraduate Certificate the engineering professional has a management and teaching staff with experience in the field of Industry 4.0 and a high qualification in engineering. Their knowledge in this booming sector will be essential for students to progress in their professional careers.





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*A teaching team with experience in the Robotics sector will show you the recent advances and applications in Automation in Industry”*

## Management



### Dr. Ramón Fabresse, Felipe

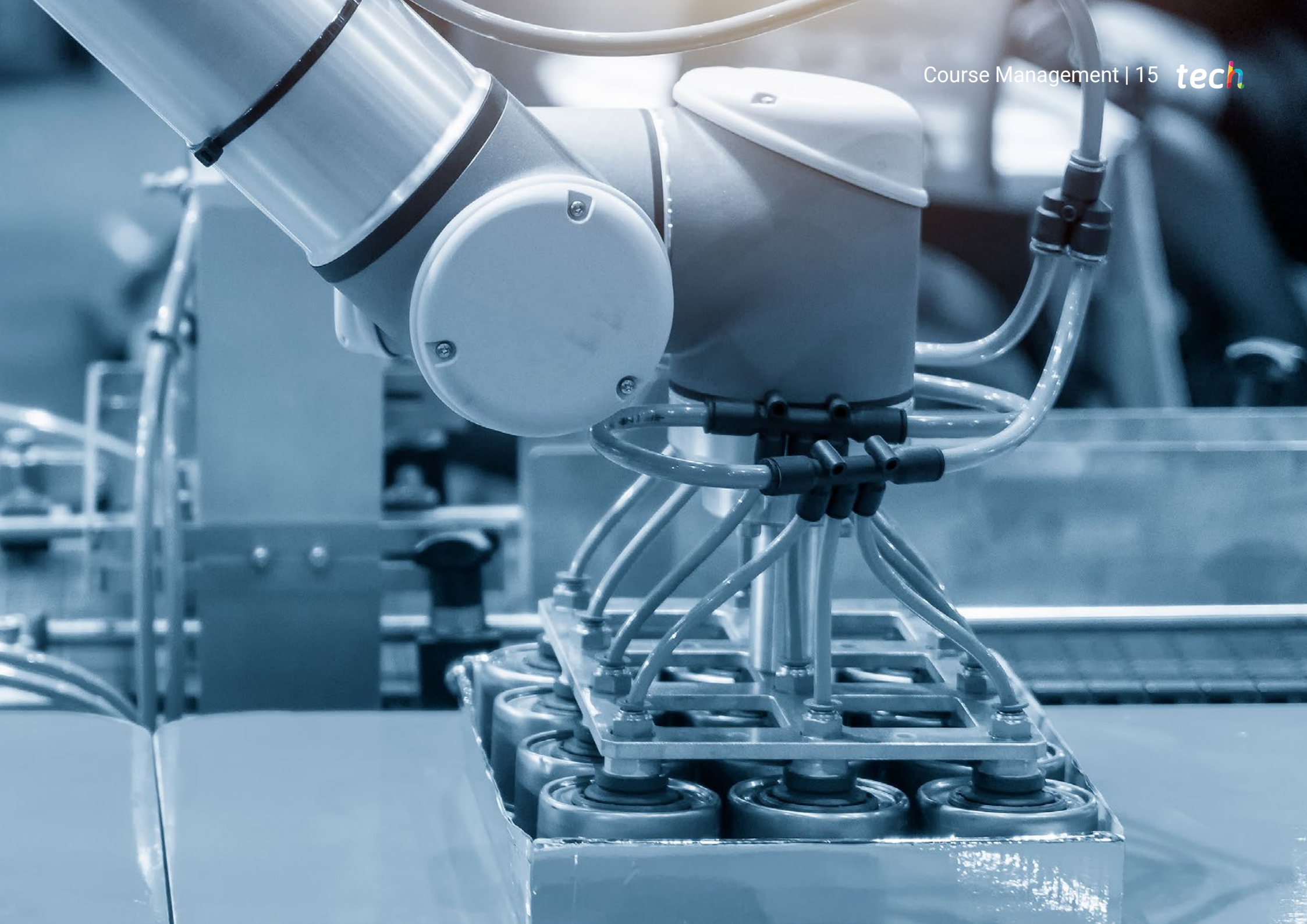
- ♦ Senior Software Engineer at Acurable
- ♦ NLP Software Engineer at Intel Corporation
- ♦ Software Engineer in CATEC, Indisys
- ♦ Researcher in Aerial Robotics at the University of Seville
- ♦ PhD Cum Laude in Robotics, Autonomous Systems and Telerobotics at the University of Seville
- ♦ Degree in Computer Engineering at the University of Seville
- ♦ Master's Degree in Robotics, Automation and Telematics at the University of Seville

## Professors

### Mr. Rosado Junquera, Pablo J.

- ♦ Engineer Specialist in Robotics and Automatization
- ♦ R&D Automation and Control Engineer at Becton Dickinson & Company
- ♦ Amazon Logistic Control Systems Engineer at Dematic
- ♦ Automation and Control Engineer at Aries Ingeniería y Sistemas
- ♦ Graduate in Energy and Materials Engineering at Rey Juan Carlos University.
- ♦ Master's Degree in Robotics and Automation at the Polytechnic University of Madrid
- ♦ Master's Degree in Industrial Engineering at the University of Alcalá





# 04

## Structure and Content

Throughout the 150 teaching hours, the engineering professionals will have access to a syllabus that has been developed for students to acquire the most comprehensive knowledge in the field of Robotics in Industry. An updated syllabus made up of video summaries, specialized readings and practical cases that can be accessed in its entirety from the start of this Postgraduate Certificate. A program with a theoretical-practical approach, which will lead you to master the design of automated systems, electrical design, programming and configuration of programmable logic controllers PLCs or the implementation of automation.







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*This Postgraduate Certificate allows you to add another step forward in your career and in Industry 4.0”*

## Module 1. Robotics in the Industrial Process Automation

- 1.1. Design of Automated Systems
  - 1.1.1. Hardware Architectures
  - 1.1.2. Programmable Logic Controllers
  - 1.1.3. Industrial Communication Networks
- 1.2. Advanced Electrical Design I: Automation
  - 1.2.1. Design of Electrical Panels and Symbology
  - 1.2.2. Power and Control Circuits Harmonics
  - 1.2.3. Protection and Grounding Elements
- 1.3. Advanced Electrical Design II: Determinism and Safety
  - 1.3.1. Machine Safety and Redundancy
  - 1.3.2. Safety Relays and Triggers
  - 1.3.3. Safety PLCs
  - 1.3.4. Safe Networks
- 1.4. Electrical Actuation
  - 1.4.1. Motors and Servomotors
  - 1.4.2. Frequency Inverters and Controllers
  - 1.4.3. Electrically Actuated Industrial Robotics
- 1.5. Hydraulic and Pneumatic Actuation
  - 1.5.1. Hydraulic Design and Symbology
  - 1.5.2. Pneumatic Design and Symbology
  - 1.5.3. ATEX Environments in Automation
- 1.6. Transducers in Robotics and Automation
  - 1.6.1. Position and Velocity Measurement
  - 1.6.2. Force and Temperature Measurement
  - 1.6.3. Presence Measurement
  - 1.6.4. Vision Sensors
- 1.7. Programming and Configuration of Programmable Logic Controllers PLCs
  - 1.7.1. PLC Programming: LD
  - 1.7.2. PLC Programming: ST
  - 1.7.3. PLC Programming: FBD and CFC
  - 1.7.4. PLC Programming: SFC



- 1.8. Programming and Configuration of Equipment in Industrial Plants
  - 1.8.1. Programming of Drives and Controllers
  - 1.8.2. HMI Programming
  - 1.8.3. Programming of Manipulator Robots
- 1.9. Programming and Configuration of Industrial Computer Equipment
  - 1.9.1. Programming of Vision Systems
  - 1.9.2. SCADA/Software Programming
  - 1.9.3. Network Configuration
- 1.10. Automation Implementation
  - 1.10.1. State Machine Design
  - 1.10.2. Implementation of State Machines in PLCs
  - 1.10.3. Implementation of Analog PID Control Systems in PLCs
  - 1.10.4. Automation Maintenance and Code Hygiene
  - 1.10.5. Automation and Plant Simulation

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*Enroll now and acquire the most advanced knowledge in the implementation of automation systems”*



05

# Methodology

This academic program offers students a different way of learning. Our methodology uses a cyclical learning approach: **Relearning**.

This teaching system is used, for example, in the most prestigious medical schools in the world, and major publications such as the **New England Journal of Medicine** have considered it to be one of the most effective.







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*Discover Relearning, a system that abandons conventional linear learning, to take you through cyclical teaching systems: a way of learning that has proven to be extremely effective, especially in subjects that require memorization"*

## Case Study to contextualize all content

Our program offers a revolutionary approach to developing skills and knowledge. Our goal is to strengthen skills in a changing, competitive, and highly demanding environment.

“

*At TECH, you will experience a learning methodology that is shaking the foundations of traditional universities around the world”*



*You will have access to a learning system based on repetition, with natural and progressive teaching throughout the entire syllabus.*



*The student will learn to solve complex situations in real business environments through collaborative activities and real cases.*

### A learning method that is different and innovative

This TECH program is an intensive educational program, created from scratch, which presents the most demanding challenges and decisions in this field, both nationally and internationally. This methodology promotes personal and professional growth, representing a significant step towards success. The case method, a technique that lays the foundation for this content, ensures that the most current economic, social and professional reality is taken into account.

“*Our program prepares you to face new challenges in uncertain environments and achieve success in your career”*

The case method is the most widely used learning system in the best faculties in the world. The case method was developed in 1912 so that law students would not only learn the law based on theoretical content. It consisted of presenting students with real-life, complex situations for them to make informed decisions and value judgments on how to resolve them. In 1924, Harvard adopted it as a standard teaching method.

What should a professional do in a given situation? This is the question that you are presented with in the case method, an action-oriented learning method. Throughout the program, the studies will be presented with multiple real cases. They will have to combine all their knowledge and research, and argue and defend their ideas and decisions.

## Relearning Methodology

TECH effectively combines the Case Study methodology with a 100% online learning system based on repetition, which combines 8 different teaching elements in each lesson.

We enhance the Case Study with the best 100% online teaching method: Relearning.

*In 2019, we obtained the best learning results of all online universities in the world.*

At TECH, you will learn using a cutting-edge methodology designed to train the executives of the future. This method, at the forefront of international teaching, is called Relearning.

Our university is the only one in the world authorized to employ this successful method. In 2019, we managed to improve our students' overall satisfaction levels (teaching quality, quality of materials, course structure, objectives...) based on the best online university indicators.





In our program, learning is not a linear process, but rather a spiral (learn, unlearn, forget, and re-learn). Therefore, we combine each of these elements concentrically.

This methodology has trained more than 650,000 university graduates with unprecedented success in fields as diverse as biochemistry, genetics, surgery, international law, management skills, sports science, philosophy, law, engineering, journalism, history, and financial markets and instruments. All this in a highly demanding environment, where the students have a strong socio-economic profile and an average age of 43.5 years.

*Relearning will allow you to learn with less effort and better performance, involving you more in your training, developing a critical mindset, defending arguments, and contrasting opinions: a direct equation for success.*

From the latest scientific evidence in the field of neuroscience, not only do we know how to organize information, ideas, images and memories, but we know that the place and context where we have learned something is fundamental for us to be able to remember it and store it in the hippocampus, to retain it in our long-term memory.

In this way, and in what is called neurocognitive context-dependent e-learning, the different elements in our program are connected to the context where the individual carries out their professional activity.



This program offers the best educational material, prepared with professionals in mind:



### Study Material

All teaching material is produced by the specialists who teach the course, specifically for the course, so that the teaching content is highly specific and precise.

These contents are then applied to the audiovisual format, to create the TECH online working method. All this, with the latest techniques that offer high quality pieces in each and every one of the materials that are made available to the student.



### Classes

There is scientific evidence suggesting that observing third-party experts can be useful.

Learning from an Expert strengthens knowledge and memory, and generates confidence in future difficult decisions.



### Practising Skills and Abilities

They will carry out activities to develop specific skills and abilities in each subject area. Exercises and activities to acquire and develop the skills and abilities that a specialist needs to develop in the context of the globalization that we are experiencing.



### Additional Reading

Recent articles, consensus documents and international guidelines, among others. In TECH's virtual library, students will have access to everything they need to complete their course.





#### Case Studies

Students will complete a selection of the best case studies chosen specifically for this program. Cases that are presented, analyzed, and supervised by the best specialists in the world.



#### Interactive Summaries

The TECH team presents the contents attractively and dynamically in multimedia lessons that include audio, videos, images, diagrams, and concept maps in order to reinforce knowledge.

This exclusive educational system for presenting multimedia content was awarded by Microsoft as a "European Success Story".



#### Testing & Retesting

We periodically evaluate and re-evaluate students' knowledge throughout the program, through assessment and self-assessment activities and exercises, so that they can see how they are achieving their goals.





06

# Certificate

The Postgraduate Certificate in Robotics in Industrial Process Automation guarantees students, in addition to the most rigorous and up-to-date education, access to a Postgraduate Certificate issued by TECH Technological University.





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*Successfully complete this program and receive your university qualification without having to travel or fill out laborious paperwork”*

This **Postgraduate Certificate in Robotics in Industrial Process Automation** contains the most complete and up-to-date program on the market.

After the student has passed the assessments, they will receive their corresponding **Postgraduate Certificate** issued by **TECH Technological University** via tracked delivery\*.

The diploma issued by **TECH Technological University** will reflect the qualification obtained in the Postgraduate Certificate, and meets the requirements commonly demanded by labor exchanges, competitive examinations, and professional career evaluation committees.

Title: **Postgraduate Certificate in Robotics in Industrial Process Automation**

Official N° of hours: **150 h.**



\*Apostille Convention. In the event that the student wishes to have their paper diploma issued with an apostille, TECH EDUCATION will make the necessary arrangements to obtain it, at an additional cost.

future

health confidence people

education information tutors

guarantee accreditation teaching

institutions technology learning

community commitment

personalized service innovation

knowledge present

online training

development language

classroom

**tech** technological  
university

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